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ABSTRACT

This paper discusses the use of computer-mediated communication (CMC) in college teaching, especially for the teacher who is new to teaching with CMC. In part, it offers a personal narrative of how the author developed use of CMC in his teaching. It discusses the nature of CMC as a medium of communication and introduces the teacher to many practical issues involved in: (1) teaching students to use CMC; and (2) using CMC as part of a course. It discusses the ways in which CMC influences teaching and learning and also discusses student responses to this technology. (Contains 57 references.) (Author/RS)

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Teaching with Computer-Mediated Communication

Leonard Shedletsky

The University of Southern Maine

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Abstract: This article discusses the use of computer-mediated communication (CMC) in college teaching, especially for the teacher who is new to teaching with CMC. In part, it offers a personal narrative of how I developed use of CMC in my teaching. It discusses the nature of CMC as a medium of communication. It introduces the teacher to many practical issues involved in (a) teaching students to use CMC and in (b) using CMC as part of a course. It discusses the ways in which CMC influences teaching and learning. It discusses student responses to this technology.

> Like other educational innovations, the ongoing integration of computers into education occurs in an atmosphere clouded by bewilderment, optimism, confusion, skepticism, prejudice, and hope. (Nancy Nelson Knupfer, 1993)

A student worker at the computer center had such a great effect on my teaching that I am still spinning from it eleven years later. He handed me a list of Bitnauts--people advertising electronically for keypals. What they were doing was something like putting up a note on the bulletin board, saying: "Here's my name and address and interests; write to me please; send me a message." Only, they were announcing their message on an electronic bulletin board and they were seeking messages sent to them via computer. They wanted "to talk" with others over the computer. They could be reached by electronic mail over Bitnet, which interconnected colleges and universities far and wide. The list consisted largely of undergraduate students and some others at universities all around the globe. At the time, in 1984, they were all among the very early users of the computer for sending and receiving messages(1). They were otherwise strangers connected to the same worldwide network of computers. They listed their interests, and most read something like this: martial arts, rock and roll, and sex. While the student worker's enthusiasm for this new form of communication, computer-mediated communication (CMC), was evident, I was unimpressed with what looked to me like a way to waste time. Of course, there was that one listing from the Weitzman Institute in Israel that stood out: over the counter drugs, unimaginatve sex, and elevator music. I did write to that Bitnaut. And he and I began to plan our international elevator music fan club. After a few exchanges of messages, we didn't write anymore. Yet the point had been made. I could sit at my computer at home or at the university and "talk" to someone very far away. Perhaps more significantly, people with overlapping interests sensed the potential for "listening" to what each other had to say. The seed of what continues to evolve into the information superhighway found fertile soil, water,

and awaited additional light.

It is perhaps prophetic that my introduction to CMC reversed the traditional roles of teacher and student and illustrated the cooperative/collaborative side of learning (Ventimiglia, 1994). I often learned something about CMC from a student worker at the computer center. I would go off to try out my new found learning, and, when our paths next crossed in the computer lab, I would have my next tutorial. And the cycle would restart: I would approach with a question(2) and learn something new about CMC. My learning seemed to progress in "natural" stages from new information, to application, to need for more information. I would ingest what I could handle, go off to try it out and return with questions and comments at some point when I was ready to bite off more. My "teacher" facilitated my learning through a problem-solving journey that largely I decided for myself. As it turns out, collaborative learning, self-pacing, non-centralized location, and facilitation; are all essential parts of the spirit of CMC, hallmark features of what so many are referring to as community, virtual community. Facilitative teaching is a natural mode of teaching/learning with CMC. While I began with people who I was in physical contact with, interestingly, the community of CMC users is not defined by proximity, but rather by people sharing information from a distance. It is defined by overlapping interests. Both space and time are transformed by CMC in ways that require the newcomer to adjust.

Speculating about the future of education as a function of new information technology, James Ogilvy (1993) wrote in a recent issue of The NEA Higher Education Journal: The fibering of America will mean that massive information resources will be available to almost anyone, almost anywhere, almost anytime. Telephone companies are already laying thousands of miles of fiber-optic lines. Tennessee is projected to be the first fully fibered state--by the end of the century. Between 2000 and 2020 the rest of the nation will be fully fibered. Consequently, bricks and mortar--campuses--will be less important as distance education learning (at home and on the job) becomes more prevalent. Just as the health-care industry is witnessing a shift from in-patient to out-patient care, with fewer and shorter stays in hospitals, so education will shift toward an "out-student" model featuring self-paced, personalized instruction at sites of the student's own choosing (pp. 39-40). CMC opens the door to information and active, self-paced, personalized learning (Shedletsky, 1993). Some days I would come away overwhelmed with the new possibilities opened up to me in a brief tutorial. I began to read about CMC on the computer, as I interacted with people via the Internet(3). I learned from others what was available and how they were using CMC in their teaching. Eventually, in 1991, I introduced CMC into a course of mine, as an adjunct to the course, not as a topic of study (Shedletsky, 1992). And somewhere along the line, it became clear that my second grade daughter and her class could do wonders with access to Internet. That was about when, along with a colleague in education and a colleague in computer use, I organized a graduate course for K-12 educators, who, in turn, might introduce their students to CMC (MacDonald, Shedletsky, & Amoroso, 1993).

I am offering my personal history with CMC to give you some idea of the reality of learning to teach with CMC. Simultaneous with my using CMC in my teaching, I was increasing my

use of CMC in my scholarship and professional associations. An editor at ERIC worked with me entirely via CMC on my book (Shedletsky, 1989). Not only did that produce a book but a personal and professional friendship. The collaboration was wonderful. Locally, I maintained contact with the secretary in our department, which eased many of the daily chores associated with chairing a department. Nationally and internationally, I maintained a sense of connection to the profession, where one might otherwise easily feel isolated and out of touch (McCreary, 1989; West and McSwiney, 1989). I was made aware of conferences; issues discussed by communication scholars; opportunities for students; electronic journal articles that my students might relish. I was able to jump start several papers I was writing by putting out an open request to which communication scholars could respond (and many did). As I learned to use CMC in new ways, I learned more about the medium. I also learned more about how I could use it in teaching. And, of course, I began to hear from students I had introduced to CMC in earlier semesters. Sometimes they simply wanted to say hello, sometimes they wanted to ask a question, occasionally a student would give me feedback about a course (often in more personal ways than I receive otherwise), and sometimes students wanted to pass on to me some information they found in their global computing. I received lots of good material that way.

Since the mid-1980's, I have been exploring computer- mediated communication. As you can see, my interest in CMC has evolved along with the ebb and flow of my work as a professor of communication. Clearly, I am a computer "user," not a person trained in computers. My emphasis is upon the tool, how it can be used to accomplish various tasks, and its effects on learning and teaching. Today, I am teaching a core curriculum, interdisciplinary course on CMC, and I use the concept of CMC broadly to mean various ways in which the computer mediates between people communicating. Currently, I am also using CMC as a teaching device ancillary to my courses on "Meaning and Communication," and "Theories of Communication." And next semester I will introduce CMC into "Introduction to Communication." I am working on developing a state-wide CMC/ITV course to teach with and about CMC. I continue to teach CMC to K-12 educators. And I use CMC in my research and teaching on a daily basis.

My teaching with CMC has always been in connection with classroom teaching, some mix of traditional classroom instruction and CMC, with most of the teacher/student contact in the classroom. There are courses given these days that are almost entirely via CMC, often referred to as distance education. Let's distinguish between teaching by means of CMC (distance education) from teaching with CMC. I have little to say about distance education in this . This paper is to tell you about my experience in teaching with CMC and to tell you about what researchers have had to say about teaching with CMC. Teaching and learning with computers is very different from teaching and learning about computers. The former transforms learning, curriculum and pedagogy in subtle but profound ways (Knupfer, 1993; Shedletsky, 1993b). Teaching about computers does not necessarily have the same effects as teaching with computers. I want to alert you to some of the subtleties in teaching with CMC. The information may help you in case you are thinking of teaching with CMC. I want to raise questions for you to consider. I want to point out problems I've encountered and

successes too. I want to encourage the newcomer to teaching with CMC--it can be done and with real success, judging from student reactions.

How I've Used CMC in My Teaching

I have taught with CMC in three different ways. First, I introduced CMC into an existing course, "Meaning and Communication," as an ancillary device. My objective there was simply to extend class discussion time by connecting students to one another and the instructor via electronic mail. Students were trained to log on to the university's mainframe computer and to use the mail utility. They were taught just enough to function with electronic mail and to expand their know-how, if they wished. They were taught to read and create mail; to save mail in a logfile; to work with a Names file so that they could send mail to the class members in one stroke.

Their assignment was simply to talk to one another via electronic mail and to save their correspondence (both sent and received--the logfile or journal) to hand in to me at the end of the semester. The logfile or journal of e-mail was used for 10% of their grade, and it was graded on a rough, more or less pass/fail basis. Students were encouraged to discuss course content, but they were told that they could talk about whatever they wanted, including social chat.

A second way in which I have taught with CMC is in teaching a core curriculum undergraduate course. In this instance, a great deal of course time was devoted to teaching and practicing CMC. This was a team-taught course, with interdisciplinary learning as an important component. We met twice a week, an hour and a half for lab work and an hour and a half for lecture/discussion. In addition to being introduced to the Internet, students read about significant issues in CMC and wrote scholarly term papers.

A third way in which I have taught with CMC is in team- teaching a two-week summer institute to K-12 educators. This course was devoted to an introduction to the Internet so that educators could go back to their schools, libraries, and administrative tasks and make use of the Internet.

Changed Patterns of Behavior & Thinking

There is a growing literature on teaching with CMC (Kuehn, 1994). It turns out that it is not a simple subject. Adding CMC to an environment is not simply adding one variable. CMC has the potential to transform patterns of behavior and thinking (Sproull and Kiesler, 1991). It changes the environment to which it is added. It can bring surprises. It can add much to a course; and it can be a grand flop. We cannot forget that teaching with CMC is still teaching, with all its artistry and foibles. Relating teaching with CMC to classroom teaching, Kaye (1991) wrote: many of the key social skills needed for nurturing online collaboration are not specific to the CMC environment. They are the skills needed by any tutor, facilitator, or chairperson involved in a peer learning situation . . . these include the ability to make group

members aware of the fact that their own experiences are important and worth contributing, and that other peers can be as valuable a source of expertise and knowledge as the course materials. Clearly, educators whose professional experience before using CMC is that of the traditional classroom teacher who tightly controls turn-taking, and who is perceived by students as the main source of expertise and knowledge, may have difficulty in adapting to the far more open and less controllable environment of computer conferencing. On the other hand, learners and tutors who are comfortable with the basic premises of peer learning and small group work (in the face-to-face situation) will . . . adapt well to the CMC environment, and take collective responsibility for progressing the online discussions. (p. 15) Riel (1993) explains: "Change does not lie with communication technology itself. It is the teachers and the strategies they use to incorporate collaborative learning into their educational practices that make a difference." She adds: "If there is change, it will be in the way teachers and students create the context of a classroom and the interaction that takes place among the people who make up the life of a classroom. Global education will have to address teacher education as well as student education before it will be an important component in classroom instruction" (pp. 235-236). Introducing computer-mediated communication might influence who communicates with whom, how much students and teachers say to one another, the quality of their talk, or even the style of teaching and learning. With changing roles come other changes in how people relate to the educational system. CMC has the potential to transform how we think of the workplace or the learning place. Place becomes less important. The relationship of the teacher to the student undergoes a shift. Increasingly, the teacher becomes a collaborator in learning. No wonder teaching with CMC is not predictable to someone new at it. What role change is?

Change takes time. Both students and teachers often require weeks and months to adjust to CMC. Some embrace it immediately, but a good many need time to feel secure with this innovation in communication. And of course, it is one thing to learn to use CMC, and yet quite another to introduce it into the classroom (Amoroso, MacDonald, & Shedletsky, 1993). Knupfer (1993) writes: Even the most traditional teachers who use computers effectively in their classrooms are finding that once they become secure with their ability to implement the technology, the very structure of their teaching changes. Instead of being the source of information, the teacher becomes the facilitator of information, guiding the student in the direction of a solution and perhaps encountering larger issues along the way. In solving the steps of a problem, the students often become more knowledgeable about the topic than the teacher. In order to be successful at this method, the teacher must be willing to release the control of learning to the students and feel secure in a different role. In such a role there is potential for the students and teacher to learn together, to learn by discovery, to access information beyond the intent of the original lesson plan, and to explore new types of projects. (p. 173)

It is not difficult to justify the need to study CMC (see section (b) below). But the difficult and important point to make here is that we need to think about lots of surrounding issues in teaching with CMC. For instance, a few teaching issues that require consideration are as follows: Why teach with CMC--for what purpose? How do you get started? How much

course time is required to introduce CMC? How do you integrate CMC into a course? How do you motivate students to use CMC for course assignments? How steeped in CMC must the teacher be to venture into this area? Is it worth it? What do the students get out of CMC? Will collaboration with a technologically oriented faculty member be necessary, and if so, will there be collaboration issues to consider? How should students be introduced to CMC? Is the emphasis on skills, communication implications, public policy, teaching and learning? And many other questions.

It can be difficult to anticipate how CMC will work in teaching and learning. Variables that are easy to overlook can have profound effects on the students' use of CMC. The individual's perception of usefulness of CMC and perceived ease of use correlate with usage (Davis, 1989). Level of communication apprehension affects e-mail usage (Mabrito, 1991). For instance, a student new to CMC posted this comment to reflect her burgeoning aha! experience in communicating to her class via computer (punctuation and spelling uncorrected): First of for someone as incredible shy as myself it is a great way to talk to people and not be afraid. You don't know who I am in most cases and that takes some of the pressure of me. In most instances I can handle a negative reply only when I have time to prepare for it. The second thing that I realized is that writing skills will improve. People don't talk in full sentences these days and they don't write that way either. Maybe being forced to write everything that we say will help improve English skills. I know mine can use some help. The Internet is a tool that can enhance a shy persons life. It can increase their contact with other people and decrease the pressure of meeting people. It isn't a replacement for people but it is easy to talk to in most cases it doesnít talk back.

It is important to understand that we need to think about lots of issues in undertaking a new course or unit on CMC, or in introducing CMC into an existing course, e.g., the social context (Hartman, Neuwirth, Kiesler, Sproull, Cochran, Palmquist, and Zubrow, 1991); learning styles (Bostrom, Olfman, & Sein, 1990). As we know from other experiences, the tool itself does not get us very far without a plan, without some thinking about how to use it. Riel (1990) wrote: "Although telecomputing is an exciting new tool for facilitating distant learning, new tools alone do not create educational change. Placing this tool in the hands of isolated teachers neither provides the vision of what can be accomplished with its power nor the plan for carrying out such a vision. The power is not in the tool but in the community that can be brought together and the collective vision that they share for redefining classroom learning" (p. 35).

Why teach with CMC--for what purpose?

Writing about computers, networks and education, Kay (1991) wrote: "Children learn in the same way as adults, in that they learn best when they can ask their own questions, seek answers in many places, consider different perspectives, exchange views with others and add their own findings to existing understandings" (p. 146). CMC is a medium that leads us to discovery learning. It transforms our views on education, learning, teaching, and computing. Students of various ages and stripes take to it very quickly. Although, it should

be added that some need to make it over an initial hurdle of resistance or just plain difficulty in developing the mental map needed for this new conceptual terrain. Transformations take time. With that done, CMC frees students to communicate with one another and with the teacher. It allows them to raise questions and seek answers.

In my experience, given sufficient training and motivation to use CMC, undergraduates and k-12 educators generally enjoy it. For some there is a struggle, perhaps an awkward period of adjusting to a particular computer software, or a difficulty in scheduling time in the day to get to a computer. But more often than not, even these people come to enjoy CMC after some time.

One reason to teach with CMC is that it can facilitate discussion and active involvement of students in the subject (Hiltz, 1986; McComb, 1994). The additional time given to electronic discussion appears to increase the willingness of students to speak in class. Under the right conditions, students can carry on intellectual debate over course issues via CMC (Hansen et al., 1991). My students did that when we set up our own conference. Frequently, however, what I have observed is a considerable amount of social talk with e-mail (Kuehn, 1994). But social talk can facilitate classroom discussion as students encourage one another, build self confidence and morale (Shedletsky, 1993a). And CMC can reduce some communication anxieties (Coombs, 1993).

I have found that where students are given computer access to one another via electronic mail, with little to no additional structure than the assignment to talk to one another, hopefully about course content, the discussion is sparse and more social than intellectual (Shedletsky, 1993a). However, where a computer conference is held and the instructor takes part, initiates and responds to student comments, then a valuable and lively debate may ensue. But even here, not every student takes part. But then, I must remind myself that not every student speaks up in the classroom either.

Why Should Students Learn to Use CMC?

New communication technology leads people to pay attention to different things, have contact with different people, and depend on one another differently. Change in attention means change in how people spend their time and in what they think is important. Change in social patterns means change in who people know and how they feel about them. Change in interdependence means change in what people do with and for each other and how these coupled functions are organized in norms, roles, procedures, jobs, and departments. Social roles, which codify patterns of attention and social interaction, change. (Sproull and Kiesler, 1991) CMC 18 There are many good reasons for paying attention to computer-mediated communication and to courses that teach about it and with it. Perhaps the most immediate reason is that it is an increasingly important part of the new communication technology. It has been estimated that ". . . all of the technological changes we are presently encountering have occurred during the last 1/10 of 1 percent of human history" (Chesebro and Bonsall, 1989). Most people, are unaware of electronic mail and its related forms because this

technology is very new. Nonetheless, this technology is revolutionary in its implications for education and commerce and it is well underway in its use. Richard Lanham (1993), an astute critic of CMC, a humanities professor and expert on teaching writing, noted that, "The students we teach are going to do most of their writing and much of their reading on an electronic screen. They are going to live--they live now--in a world of electronic text." (p. 121) Many scholars of our times have referred to our current environment as the information society. In fact, information makes up the core of our economy.(4) As a nation, we develop data, exchange information, manipulate ideas and transfer numbers. It has been estimated that over 50 percent of those employed in the United States are involved in data-processing activities (Fowler, 1983). According to some estimates, "by the year 2010, virtually every job in the country will require some skill with information-processing technology" (Cetron, 1988). The very nature of work, with a shift from the concrete to the abstract, requires reconceptualization.

As stated above, the computer requires us to reconceptualize our notions of such ordinary things as work and education. This is due to a combination of factors: (1) linking people via computer is significantly influenced by variables of human communication; (2) computer-mediated communication is a new mode or medium of communication (Lanham, 1993; Rice, 1990; Williams, Rice, and Rogers, 1988). Unlike ordinary face-to-face communication, CMC is without seeing one another. Unlike ordinary interpersonal communication, with CMC, spatial location of interactants is irrelevant. Unlike ordinary, face-to-face interaction, CMC is a text-based tool that can be synchronous (communicators interacting at the same time) or, more frequently, asynchronous (communicators interacting at different times). Our access to people and information is changed by this new medium. And in turn its potential to change patterns of interaction is brought forth.

In addition to its growing role in education, health care, and commerce, CMC offers the scholar of communication the opportunity to study a truly new medium. CMC allows the student to try out a new medium and to thereby learn first hand what it means to communicate within a medium; it allows the student to learn how one medium differs from another; how such differences affect human behavior.

Again, I use CMC in a variety of courses, sometimes as the topic of the course and sometimes as an adjunct to the course. In either case, my objectives are a mix of the following: (a) to introduce the student to a new medium of communication, (b) to empower the learner via access to people and information, CMC 21, (c) to introduce the student to a means of communication that is increasingly a part of the world we live in, and (d) to facilitate discussion.

How do you get started?

Once I decided to try my hand at using CMC in my teaching, I was amazed at how easy it was to get started. The toughest decision had to do with my perception of my own skills. Could I teach the skills involved and would I be able to adjust to problems as they arose? I

started with CMC as a small part of a course, and I limited its use to e- mail, taught in two meetings with informal follow-up in the classroom. The investment was minimal and it was treated as an "experiment."

Once the decision to go ahead with CMC was made, the rest was simply a matter of organizing the necessary pieces. It is critical to check with the institution's mainframe director; to arrange for user-id's for the students; to schedule time in the computer classroom. And in case you are new to this technology and somewhat insecure about it, as I was, you can determine in advance just who is nearby who can get you out of a jam (hardware or software)--mostly to ease the mind.

So, what I am saying is that the logistics are relatively simple. The part that takes some hard thinking and learning from experience is just how to integrate CMC into your course; what to ask students to do with it; and how to grade it. Hopefully, what I have said in the rest of this discussion will help on those questions. (d) How much time is needed to train the students?

How much time is needed to train the students?

It depends. Bull, Harris, Lloyd, & Short (1989) report that ". . . experience has shown that users may require as much as five times the training to achieve the same level of proficiency on some electronic mail systems in comparison to others" (p. 30). I have found that novices, people with no experience on our mainframe computer, can be introduced to the e-mail system and editor (Xedit) in two one and one-half hour lessons. Keep in mind that during each session in which the student is introduced to CMC, it is critical that a good part of that session be devoted to hands-on experience, show and do (Bailey and Cotlar, 1994). After the first session, most students can send and receive electronic mail. Minor problems arise as students explore the system and try the assignment of sending mail to others in the class. After the second session, problems with sending and receiving e-mail are cleared up and students can save in a permanent file their electronic correspondence and can use a names file to send mail to by name to individuals in the class or to all of the class at once. In addition, students raise questions about CMC throughout the course, as the need arises. This is a good example of the teacher as facilitator. And this is a good example of self-paced learning (Laurillard, 1987). Individual differences abound. As the semester progresses, much can be done via CMC. In some instances, it is necessary to meet with the individual to get over some hurdles.

Just how do you integrate CMC into an existing course?

A number of scholars have found that it is important to integrate CMC into a course (Bailey and Cotlar, 1994; Bork, 1993; Romiszowski and de Haas, 1989; Norton, 1992); What that means is that the use of CMC must play a part along with other elements of a course. For instance, assignments may be distributed via CMC; help on quizzes may be given via CMC. Student work may be sent to the teacher via CMC. CMC supported discussion may be

monitored and used toward the grade. But, however it is done, CMC works best if it is integrated into the course, as opposed to remaining an extra appendage. Grading, then, must take CMC efforts into account. That is another way in which to integrate CMC into the course, i.e., by having it count towards the grade.

What all of this means is that the teacher must think about just how to use CMC in the course and how much of the grade will come from computer-mediated communication. Some teachers have required a specific number of student log-ons per week, with a specific minimal number of entries. I have not always required a minimal number of CMC entries, but I have had to accept that a fair number of students were slow to enter into the computerized discussion. Romiszowski and de Haas (1989) report on difficulties they encountered on getting students to stick with a planned topic and getting all students in a course to participate by means of CMC. Obviously, an ideal situation is to structure assignments such that students want to enter into CMC use. Integrating CMC into the course is closely connected to the next question, motivating students to use CMC.

How do you motivate students to use CMC?

Getting students to use the computer to carry out course assignments and to take part in discussion is not always easy to do. In every course I have used CMC, especially where the student is given the "loose" assignment of using CMC to discuss whatever they feel like and whenever they feel like (hopefully with some connection to the course), there are always a number of students who just don't, at least for much of the course (Hiltz, 1986). Colleagues who have tried to introduce CMC into their teaching have reported much of the same to me. Sproull and Kiesler (1991), writing about people's behavior in networked organizations, write: Making it easy to exchange information through providing open access and diverse forums is a necessary but not sufficient condition for communication to occur. Additionally, people must want to contribute to and benefit from coworkers and other resources on the network. By way of illustrating the distinction, consider a network in which anyone can send the C.E.O. a message. Being able to send messages to the boss often typifies an open access network. If the C.E.O. actually responds to received messages, then the network also embodies incentives to communicate. Motivating people to communicate via the network can be accomplished through both technical and human means. Software can motivate beneficial information exchange through, for instance, automatically notifying a contributor when someone reads his or her contribution or through filtering and organizing messages. Incentives for beneficial exchange can be conveyed through modeling (high-status people communicate via the network), evaluation feedback (rewarding electronic contributions to others), and norms (expecting people to communicate via the network routinely). (p. 165)

From my attempts at using CMC in teaching, I am inclined to agree with the suggestions of Sproull and Kiesler: modeling, rewarding, and setting norms are helpful in getting students CMC 26 to use the computer. A key underlying factor here is the learner's perception of what is beneficial. It is imperative that the learner believe that CMC is useful to her/him. That is true whether we are talking about teachers deciding to learn and introduce CMC or

k-12 students or college students or faculty. Attitudes toward computers play a real role here (Knupfer, 1993). And again, attitude and perception make up only part of the surrounding factors influencing this innovation. CMC responses from the teacher help. And I would add to this, it helps to use CMC to provide important information for students, to post assignments, and to require assignments from students via CMC.

(g) How steeped in CMC must the teacher be to venture into. How steeped in CMC must the teacher be to venture into this area? this area? We touched on this issue in (c) above, "getting started". While I cannot give you a precise answer to this, Hiltz (1986) estimates that the teacher will need 30 to 50 hours online to sufficiently learn computerized conferencing. Note that she is discussing conferencing not electronic mail here. In addition, she recommends that "teachers with no knowledge of advanced features question, I can encourage you to try out a unit on CMC, even as you continue to learn the system and work at mastering it. I have found that sharing with students in the learning process is welcomed by them. Remember, the learning community, not the authority, is well represented in CMC. Enlisting the aid of a student experienced in CMC is a good idea.

Is it worth it?

YES!

How do you monitor the students' use of CMC, if at all?

One simple way to monitor student use of CMC, where you are using electronic mail, is simply to have students keep a logfile of all their e-mail, sent and received. At the end of the semester, they can hand the logfile in paper copy or send an electronic copy to you. Alternatively, students can simply write a brief log of their CMC activities. I have relied upon the logfile in paper copy for courses where I've introduced CMC as an adjunct to the course. For those concerned with the excessive use of paper, note that all the computer paper is recyclable. You will need an experienced user to act as a technical

facilitator" (p. 103).

Depending upon just what tasks you assign and what computer applications you make use of, monitoring student work varies. For instance, if you set up a electronic conference for the class, then you have a record of use posted on the conference. In short, I have found that monitoring CMC use is straightforward. I do recommend some form of monitoring, though, for two reasons. One, to know who is doing what, in case an individual is slow to get started and shy to speak up about it. Two, to help to motivate the use of CMC. Students seem to need to know that someone cares, that the teacher is responding electronically, encouraging use of CMC, and accessible for answering questions.

What do the students get out of CMC other than being introduced to a new technology?

introduced to a new technology?

To begin with, most enjoy CMC. For many students, there seems to be a kind of aha experience. A smile breaks out. There is joy in experiencing communicating via computer.

I speculate that the joy first occurs when we receive a human response to a message we've sent. It is as simple as that. At that moment, human contact is made. We have broken out of our isolation into the communal warmth that comes with communication. Being "listened" to is always very powerful.

Further, CMC gives students control over their learning. They can explore on their own. They can ask questions in a non-threatening mode of expression. They can socialize, get to know one another, seek help. They can say what they think and be taken seriously. They can experience a novel medium of communication and all the newness that attaches to that experience.

Will collaboration with a technologically oriented faculty member be necessary, and if so, will there be faculty member be necessary, and if so, will there be collaboration issues to consider?

It is not necessary to team-teach with a computer expert. In fact, team-teaching could complicate matters, since your teaching goals and teaching approach are likely to be much different from that of an expert's. However, it is a good idea to enlist the support of the computer center staff, to be able to call upon individuals for special problems, should they arise. It is also a good idea to find a student who is an advanced user who is able to give you technical support. CMC 30

Is the emphasis on skills, communication implications, public policy, teaching and learning?

All of the components of this question, skills, communication implications, public policy, and teaching and learning, surface when you introduce CMC into the curriculum. But which, if any, will you emphasize? Depending on your answer, you would approach the task differently. You would allocate time accordingly. You would select readings and assignments in line with your objectives.

The skills emphasis is the simplest to undertake. Here the teaching work is largely show and tell and allow students ample opportunity for hands on lab time. Of course, this requires thinking through the sequence of skills, providing clear presentations, finding good texts, preparing handouts, and providing follow up help, in the lab and outside of the lab.

Communication implications, public policy, and teaching and learning with CMC tend to fall together into a social science of computer-mediated communication. Obviously, what we would read for the purpose of studying about CMC as a communication technology with social effects, and the methodology involved, is quite different from learning how to use the

technology.

Once again, depending on whether CMC is introduced as an adjunct to the course, or as a central topic of the course, my teaching approaches vary. Overall, though, the umbrella model that best describes teaching with CMC is facilitative teaching and cooperative/collaborative learning. CMC 32

Evaluation

Evaluation of CMC work is dependent upon the nature of the course. Again, see the syllabi for specific information (see Appendices A and B). Broadly, where I use CMC as an adjunct, I have students keep a electronic journal of their CMC work (i.e., a copy of what they send and receive); that journal is handed in for a grade. In the course devoted to the topic of CMC, a variety of methods for evaluating the CMC work is used, including a electronic journal, a record of CMC activities, graded laboratory assignments, a CMC-related term paper, and group work (CMC enacted).

What I consider to be the most dramatic and pointed evaluation of CMC in the course is simply what students have to say about it (Shedletsky, 1993a). They make it very clear that they enjoy learning with CMC; that it is a valued experience. I have gotten this feedback from them both informally and in numerous questionnaires. The data are clear-cut.

Notes

(1) By "early users" I am referring here to the general public. The earliest use of the computer for sending and receiving messages that I am aware of dates to the late 1960's and this on a specialized network for scientists (Sproull and Kiesler, 1991, p. 10)

(2) On occasion my "teacher" was bursting with exciting new information for me about some aspect of CMC, a new found command that opened doors to countless informational riches.

(3) For a recent and accessible overview of the Internet and CMC, see the special issue of *Communication Education*, 1994 (April), 43(2).

(4) Chesebro, J., and Bonsall, D. (1989). Computer- mediated communication: Human relationships in a computerized world, pp. 20-35, Tuscaloosa, Alabama: The University of Alabama Press.

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